A PROJECT REPORT ON

KINEMATIC ANALYSIS OF A ROBOTIC ARM FOR ASSEMBLY LINE APPLICATION USING CATIA AND ANSYS

A Project report submitted for the partial fulfillment of the requirements for award of

Degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

Submitted by

GADUTHURI GOWTHAM RAJ	21815A0313
DUKKA SAI VAMSI	21815A0310
POTHALA KIRAN KUMAR	20811A0332
ADARI AJAY	21815A0301
KANDI REDDY DILEEP	20811A0316

Under the esteemed guidance of

Mrs. P. SADHANA, M.TECH,

Assistant Professor

DEPARTMENT OF MECHANICAL ENGINEERING

AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Permanently affiliated to JNTU-Gurajada Vizianagaram, Accredited by NAAC A+, Approved by AICTE, Recognized by UGC 12f & 2b)

TAMARAM, MAKAVARAPALEM, NARSIPATNAM, ANAKAPALLI DIST. - 531113

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DEPARTMENT OF MECHANICAL ENGINEERING

AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

CERTIFICATE

This is to certify that the project entitled "**KINEMATIC ANALYSIS OF A ROBOTIC ARM FOR ASSEMBLY LINE APPLICATION USING CATIA ANSYS**" is the record of the work carried out by **GADUTHURI GOWTHAM RAJ (21815A0313), DUKKA SAI VAMSI (21815A0310) , POTHALA KIRAN KUMAR (20811A0332) , ADARI AJAY (21815A0301), KANDI REDDY DILEEP (20811A0316)**, students of final year B. Tech in the department of Mechanical Engineering. This work is done for the partial fulfillment for the award of BACHELOR OF TECHNOLOGY during the year 2023-2024.

Mrs. P. SADHANA ,M.TECH

Project Guide

Dr. V.HARI KIRAN M.TECH ,Ph.D

Head of the Department

External Examiner

ABSTRACT

This project focuses on analyzing a robotic arm designed for assembly line tasks using CATIA software. The aim is to assess its movement range, speed, and precision to optimize its performance on the assembly line. By creating a virtual prototype and running simulations, the project evaluates the arm's capabilities, including joint movements and collision detection.

Through iterative improvements, the goal is to enhance the arm's efficiency and seamlessly integrate it into assembly line operations. Key factors like reachability and cycle time are carefully considered, with a focus on adapting the arm to different tasks and production scenarios. Integration with sensors and real-time monitoring systems is explored to improve performance and reliability.

Ultimately, the project aims to advance robotic systems for assembly line use, leveraging CAD tools like CATIA for thorough analysis and optimization, thereby boosting productivity and quality in manufacturing environments.

Keywords: Robot, Manipulator, CATIA V5, ANSYS, kinematics, position.